UMATILLA HATCHERY OPERATIONS AND MAINTENANCE 8903500

SHORT DESCRIPTION:
Provide for Operation and Maintenance (O&M) funding at Umatilla Fish Hatchery which supplies the majority of the fish production for the purposes of rehabiliting chinook salmon and enhancing steelhead populations in the Umatilla River while contributing to the NPPC's goal of doubling salmon runs in the Columbia River Basin.

SPONSOR/CONTRACTOR: ODFW
Oregon Department of Fish and Wildlife
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GOALS

GENERAL:
Supports a healthy Columbia basin, Maintains biological diversity, Maintains genetic integrity, Increases run sizes or populations, Fish Propagation

ANADROMOUS FISH:
O&M

NPPC PROGRAM MEASURE:
7.4I.1

RELATION TO MEASURE:
The Umatilla Hatchery is the foundation for rehabiliting chinook salmon and enhancing steelhead in the Umatilla River (CTUIR and ODFW 1990) and is expected to contribute significantly to the Northwest Power Planning Council's (NPPC) goal of doubling salmon production in the Columbia River Basin. Hatchery production goals and a comprehensive Monitoring and Evaluation (M&E) plan were presented in the Umatilla Hatchery Master Plan (CTUIR and ODFW 1990). The comprehensive plan for M&E of Umatilla Hatchery (Carmichael 1990) was approved by the NWPPC as a critical adaptive management guide for fisheries rehabilitation in the Umatilla River. M&E of the target species reared at Umatilla Hatchery will be used to increase knowledge inherent in fisheries rehabilitation and will compliment the developing systematic M&E program.

TARGET STOCK	LIFE STAGE	MGMT CODE (see below)
Coho Salmon	All	SAE
Umatilla / Summer Steelhead	All	SAWP
Carson / Spring Chinook Salmon	All	SAE
Upriver Bright Fall Chinook Salmon	All	SAE

AFFECTED STOCK	BENEFIT OR DETRIMENT
Snake River Fall Chinook Salmon	Potentially detrimental

BACKGROUND

STREAM AREA AFFECTED
Stream name:
Umatilla River
Stream miles affected:
100
Hydro project mitigated:
Bonneville, The Dalles and John Day Dams.

LAND AREA INFORMATION
Subbasin:
Umatilla River
Land ownership:
38%Public, 11% Tribal, 51% Private
Acres affected:
1,465,600

HISTORY:

The Umatilla Fish Hatchery was authorized under the Northwest Power Planning Council's (NPPC) Fish and Wildlife Program and began operation in 1991. Hatchery funding is provided by Bonneville Power Administration. The Hatchery is used for egg incubation and rearing of spring chinook, fall chinook and summer steelhead. Four satellite facilities (Bonifer Pond, Minthorne Pond, Imeques and Thornhollow) are used for juvenile fish acclimation. Threemile is now completed and used for adult collection.

BIOLOGICAL RESULTS ACHIEVED:

Since Umatilla Hatchery began operation in 1991, 22.1 million Upriver Bright fall chinook (13.8 million produced by Umatilla Hatchery), 6.6 million spring chinook (4.5 million produced by Umatilla Hatchery), and 740 thousand summer steelhead (664 thousand produced by Umatilla Hatchery) have been released into the Umatilla River basin. In addition, 6.7 million coho salmon smolts have been released into the Umatilla River basin from Lower Columbia River Mitchell Act funded hatchery facilities. Tag return data shows that fish reared at Umatilla Hatchery are making a substantial contribution to Commercial and Recreational fisheries in the Columbia River Basin.

PROJECT REPORTS AND PAPERS:

1. Monthly Progress Reports are submitted to BPA no later than 15 days after the end of the month.
2. Annual Operating Plan (AOP) - the AOP sets forth details of operation of the hatchery consistent with:
   a. Provision of the Hatchery Management Plan (HMP) approved by the Council in October 1989; and
   b. Fish hatchery operation policies required in Oregon Administrative Rules (OAR), Chapter 635-007-0510 through 0590. A proposed AOP is to be submitted to BPA at least six months prior to the start of a Fiscal Year (March 31).
3. Section 7 and/or Section 10 Biological Assessment and Biological Opinion for 1995 to 1998 for Hatchery Operations in the Columbia River Basin.
4. Integrated Hatchery Operations Team (IHOT) - Operation Plans for Anadromous Fish Production Facilities in the Columbia River Basin Volume III, Annual Report 1995, BPA.

ADAPTIVE MANAGEMENT IMPLICATIONS:

The Umatilla River once supported large runs of spring and fall chinook, coho, and summer steelhead which provided productive fisheries for both Indians and non-Indians. Runs of chinook and coho salmon were effectively eliminated from the Umatilla River over 65 years ago and summer steelhead runs have declined from historical levels. Today, an average of 1,900 summer steelhead return annually to the Umatilla River. Salmon introduced into the river beginning in 1983 are now returning but at only a fraction of historical levels.

The decline of summer steelhead and elimination of other salmon species in the Umatilla River was largely attributed to construction of Columbia River hydroelectric dams and hydroelectric and irrigation diversions on the Umatilla River. The Hermiston Power and Light Hydroelectric Project (RM 10) and Threemile Falls Dam (RM 3) irrigation diversion built on the Umatilla River in 1910 and 1914, respectively, are believed to have caused the largest decline of salmon and steelhead in the Umatilla Basin. Additional fish losses in the basin have resulted from habitat degradation and depletion of stream flows through irrigation.

Although once abundant, viable runs of spring chinook have not been present in the Umatilla River for over 70 years (mid-late teens through late 1980's). Historically, the Lewis and Clark journals document the presence of a large village at the mouth of the Umatilla River where 700 Indians were anxiously awaiting the arrival of the spring chinook (Thwaites 1905 as cited in ODFW/CUIR 1989). This was one of the largest villages seen between The Dalles area and the mouth of the Snake River in the spring of 1806. The largest run of chinook within memory of white men was recorded in 1914 when Indians and non-Indians caught "thousands upon thousands of salmon from spring to fall" at the site of Threemile and Hermiston Power and Light dams (Van Cleve and Ting 1960). These records indicate that spring, summer, and fall chinook were abundant in the Umatilla River and that construction of these dams created areas where fish congregated. These authors state that noticeable declines in salmon and steelhead runs were reported in the years after construction of these dams. The last recorded sport harvest of 41 spring chinook salmon from the Umatilla River was reported by the Oregon Game Commission in 1956. Extensive water withdrawals from the Umatilla River Basin for irrigation and domestic use and habitat degradation have also contributed to the elimination of chinook from the Umatilla River.

Present Rehabilitation Efforts

As part of the CTUIR and ODFW Umatilla Fishery Rehabilitation Program being implemented under the NPPC's Fish and Wildlife Program [Section 1403 (4.2, 4.6)], passage, flow, and habitat conditions are being improved. These projects are designed to support the hatchery supplementation program and enhance existing and future natural production in the subbasin.

Fish Passage Improvement

Screens and fishways at the five major diversions in the lower Umatilla River (Threemile Dam, RM 3; Maxwell, RM 15; Westland, RM 27; Cold Springs, RM 29; and Stanfield, RM 32) have been reconstructed to improve downstream and upstream survival of salmon and steelhead. A smolt and adult trapping facility has been constructed at Threemile Dam and a smolt trapping facility at Westland, to collect and transport smolts and adults around lower river diversions during periods of low flow.

Flow Enhancement

The CTUIR, ODFW, and Bureau of Reclamation have designed both interim and long-term projects to address flow problems in the Umatilla Basin. The CTUIR and ODFW have developed in interim flow enhancement project to increase flows in the Umatilla River prior to implementation of the Bureau of Reclamation Umatilla Basin Project. These plans have included use of West Extension Irrigation District pumps to improve flow below Threemile Dam and use of stored water from McKay Reservoir to improve flow below McKay Creek (RM 51). The success of these interim efforts has varied because of limited water availability during recent drought years.

The Umatilla Basin Project was developed by the Bureau of Reclamation in conjunction with the CTUIR, ODFW, and local agricultural, irrigation, and civic organizations. The Umatilla Basin Project is designed to achieve long-term fishery goals and alleviate water use conflicts in the Umatilla Basin. Project features are designed to meet stream flow objectives of 250 to 300 cfs during migration periods throughout the lower 51 miles of the mainstem Umatilla River. The project includes two phases of implementation. Phase I provides a pumping facility to exchange water with the West Extension Irrigation District and increase flows below Threemile Dam. Phase II is a larger Columbia River pumping complex designed to deliver water to the Hermiston and Stanfield Irrigation Districts (via Cold Springs Reservoir) and increase flows below McKay Creek during critical fish migration periods. Phase I was completed in the fall of 1992 and began operating in the spring of 1993. Phase II is approximately 43% completed and with final completion expected in 1998. These completion dates are dependent upon congressional funding appropriations for the Basin Project.

Habitat Improvement

The CTUIR, ODFW, and Forest Service are currently implementing a habitat enhancement plan for the Umatilla River and tributaries (ODFW et al. 1988). Initial riparian and in-stream habitat improvements have been completed on 68 miles of private, federal, and reservation lands in the Umatilla River Basin. Habitat improvements are planned to improve spawning and rearing habitat for naturally spawning summer steelhead and spring chinook. Additional habitat improvement needs have been identified in the Umatilla River Subbasin Salmon and Steelhead Plan (Umatilla Subbasin Plan) and are proposed for implementation in the NPPC's Integrated System Plan (1991). The future program is designed to emphasize watershed-wide land use causative factors and related improvements affecting fisheries habitat.

Artificial Propagation

Beginning in 1981, Oregon Department of Fish and Wildlife began reprogramming hatcheries to supply salmon and steelhead smolts for the Umatilla River. Umatilla Hatchery was constructed and began operation in the fall of 1991. Construction of the Umatilla Hatchery adult facilities at Threemile was completed in the winter of 1996. Construction of juvenile satellite facilities began in 1983, four of the proposed five juvenile acclimation sites have been completed.

PURPOSE AND METHODS

SPECIFIC MEASUREABLE OBJECTIVES:

The NPPC authorized the hatchery construction to produce up to 290,000 pounds of salmon and steelhead for release into the Umatilla River Basin. This production is designed to:

1. Partially mitigate for fish losses caused by hydroelectric dams on the Columbia River.
2. Use artificial propagation as a component of the Umatilla fisheries restoration program to achieve natural and hatchery adult return goals as described in the Umatilla Hatchery Master Plan (1989) and Supplement (1993).
3. Test Michigan- versus Oregon-type rearing strategies (oxygen supplementation) and other experimental and supplemental rearing strategies.
4. Contribute to the NPPC's goal for the Columbia Basin to "double the total number of adult salmon and steelhead in the Columbia Basin as fast as possible without further loss of biological diversity among or within anadromous and resident fish populations."

CRITICAL UNCERTAINTIES:

Specific uncertainties related to this project are listed within the Umatilla Hatchery M&E Project Proposal (Project #9000500).

BIOLOGICAL NEED:

The Umatilla Hatchery was authorized under the NPPC's Fish and Wildlife Program and began operation in 1991. Hatchery fundi

ng is provided by the Bonneville Power Administration. The NPPC authorized the hatchery construction to produce up to 290,000 pounds of salmon and steelhead for release into the Umatilla River Basin. This production is designed to partially mitigate for fish losses caused by hydroelectric dams on the Columbia River and to use artificial propagation as a component of the Umatilla fisheries restoration program to achieve natural and hatchery adult return goals as described in the Umatilla Hatchery Master Plan and supplement.

HYPOTHESIS TO BE TESTED:

1. The CTUIR and ODFW have established an annual run size goal (in terms of adult returns to the Umatilla River) of 11,000 naturally and hatchery produced spring chinook (1,000 natural, 10,000 hatchery) by the year 2006. Achievement of these goals will be accomplished primarily by the release of smolts produced at Umatilla Hatchery, Northeast Oregon hatchery facilities, and other hatcheries in the Columbia Basin.
2. The annual run size goal for upriver bright fall chinook is 21,000 naturally and hatchery produced fish (11,000 natural, 10,000 hatchery). The goal for summer steelhead is an annual adult return of 9,670.

At full production (290,000 lbs.) Umatilla Hatchery should be able to produce 100% of the summer steelhead, 85% of the upriver bright fall chinook, and 34% of the spring chinook required to meet the adult return goals outlined in the Umatilla Hatchery Master Plan.

METHODS:

Objective 1: The proposed annual salmon and steelhead production at Umatilla Hatchery with designed water flows is: 5,940,000 subyearlings (99,000 lbs.) of upriver bright fall chinook;210,000 yearlings (42,000 lbs.) of spring chinook;1,080,000 subyearlings (72,000 lbs.) of spring chinook; and210,000 yearlings (42,000 lbs.) of summer steelhead.
Objective 2: Minimize interactions with other fish populations through proper rearing and release strategies.
Objective 3: Maintain stock integrity and genetic diversity of each unique stock through proper management of genetic resources.
Objective 4: Maximize survival at all life stages using disease control and disease prevention techniques. Prevent introduction, spread or amplification of fish pathogens.
Objective 5: Conduct environmental monitoring to ensure that hatchery operations comply with water quality standards and to assist in managing fish health.
Objective 6: Communicate effectively with other fish producers, managers and the public.

BRIEF SCHEDULE OF ACTIVITIES:
Fiscal Year 1997:
1. Implement actions as set forth in the Umatilla Hatchery and Basin Annual Operation Plan (AOP, 1996).
2. Submit Monthly Progress Reports as specified in Reporting Requirements section of BPA Intergovernmental Agreement.
3. Submit to BPA by March 31, 1997, a proposed AOP for Fiscal Year 1998.

Fiscal Year 1998-2002:
Same as above applicable to current fiscal year objectives.

PLANNED ACTIVITIES

SCHEDULE:

O&M Phase **Start** 10/01/96 **End** 09/30/97 **Subcontractor**

Task Activities for Fiscal Year 1997 include: Implemention of fish propagation activities at Umatilla Hatchery and other activities as set forth in the Umatilla Hatchery and Basin Annual Operation Plan (AOP); Submit Progress Reports as specified in Reporting Requirements section of the BPA Intergovernmental Agreement; Submit to BPA by March 31, 1997 a proposed AOP for fiscal year 1998.

PROJECT COMPLETION DATE:

Ongoing

CONSTRAINTS OR FACTORS THAT MAY CAUSE SCHEDULE OR BUDGET CHANGES:

BPA submitted a Biological Assessment (BA) for the 1994 through 1998 operation of Umatilla Hatchery and associated facilities. The BA evaluates whether the proposed operation of Umatilla Hatchery and associated facilities are likely to adversely affect the continued existence of Snake River sockeye salmon, Snake River spring/summer chinook salmon, Snake River fall

chinook salmon or their critical habitat.
Based on information in the BA, BPA determined that the proposed operation at the Umatilla Hatchery from 1994 through 1998 would not likely adversely affect listed Snake River salmon or their critical habitat.

On April 11, 1995, NMFS issued a Biological Opinion for 1995 through 1998 Hatchery Operations in the Columbia Basin. The operation of Umatilla Hatchery and associated facilities is included within this Biological Opinion. Umatilla Hatchery operations will comply with all prudent alternatives contained in the Biological Opinion to reduce impacts by reducing competition with and predation on chinook salmon and sockeye salmon fry.
All artificial fish propagation facilities operate with some level of accepted risk of not being able to achieve their desired result. At hatchery facilities this is more commonly expressed in terms of not achieving the designed fish production goals for a particular brood class. Umatilla Hatchery is no exception. There is always the potential of pump or multiple well water pump failure, electrical power failure or flood conditions to name a few that could potentially jeopardize all or part of a brood class at this facility.

OUTCOMES, MONITORING AND EVALUATION

SUMMARY OF EXPECTED OUTCOMES

Expected performance of target population or quality change in land area affected:
It is expected that the Umatilla Hatchery production program will ultimately provide the desired numbers of adult returns to the Umatilla River as identified in the Umatilla Hatchery Master Plan (1989) and Supplement (1993). However, with reduced water flows available, Umatilla Hatchery will be operating at reduced fish production levels. The reduced production level goals for Fiscal Year 1997 are 200,000 spring chinook yearlings (25,000 lbs.), 255,000 upriver bright fall chinook yearlings (31,875 lbs.), 2,682,000 upriver bright fall chinook subyearlings (44,700 lbs.), and 150,000 summer steelhead yearlings (30,000 lbs.) for release into the Umatilla River Basin.

Present utilization and convservation potential of target population or area:
Present use of chinook salmon and steelhead populations are for commercial, sport, and Tribal fisheries in the Columbia and Umatilla River Basins. The conservation potential for all salmon and steelhead stocks is being evaluated but is estimated at more than 80,000 fish in the Columbia River Basin.

Assumed historic status of utilization and conservation potential:
The historic use was major fisheries which supported Indian and Non-Indian fisheries (Boyce 1995). Historic numbers of fish are unknown, but are believed to be major contributors to Columbia River Basin fisheries.

Long term expected utilization and conservation potential for target population or habitat:
The target populations are expected to significantly contribute to the NPPC's goal of doubling the total number of adult salmon and steelhead in the Columbia River Basin and toward establishment or supplementation of naturally reproducing populations in the Umatilla River. Uses include Commercial, Sport, and Tribal fisheries in the Columbia River and Umatilla River Basins. Long term adult goals to the mouth of the Umatilla River are: 11,000 natural and 10,000 hatchery fall chinook, 1,000 natural and 10,000 hatchery spring chinook, 4,000 natural and 5,670 hatchery steelhead and an undetermined number of natural and 6,000 hatchery coho.

Contribution toward long-term goal:
In addition to producing the desired numbers of spring and fall chinook salmon and summer steelhead at Umatilla Hatchery for release into the Umatilla River annually, products of the project will contribute to: restoring and supplementing salmon and steelhead populations in the Umatilla River, the Columbia River doubling goal and provide the physical facilities in which to evaluate unique new rearing methods that will have implications for fish production throughout the Columbia River Basin.

Indirect biological or environmental changes:
Supplementation of hatchery steelhead may or may not adversely affect wild stocks; straying of hatchery stocks outside the Umatilla River Basin may or may not adversely affect wild stocks in other basins.

Physical products:
Reduced fish production goals,as a result of reduced well water flows, for Fiscal Year 1997 are: 200,000 spring chinook yearlings (25,000 lbs.), 155,000 fall chinook yearlings (31,875 lbs.), 2,682,000 fall chinook subyearlings (44,700 lbs.) and 150,000 summer steelhead (30,000 lbs.).

Environmental attributes affected by the project:
Enviromental attributes include a limited amount of pathogen-free well water of desired temperatures which is used for fish rearing at Umatilla Hatchery. Design well water flows needed to acheive full fish production objectives as identified in the Umatilla Hatchery Master Plan is 15,000 gpm.

Changes assumed or expected for affected environmental attributes:
Decreased well water flows have limited the fish production capabilities at Umatilla Hatchery. Ultimate Fish production objectives will not be realized until the water shortage situation is resolved. Alternate water supplies and /or treatment of raw Columbia River water may be options. The USACE is currently evaluating options.

Assessment of effects on project outcomes of critical uncertainty:
Outcomes will be assessed in the Umatilla Hatchery M&E programs for both artificial and natural production currently being conducted by ODFW and CTUIR.

Information products:
Specific hatchery effectiveness analysis is conducted within M&E Project # 9000500 which includes monthly length, weight, and smolt condition data,smolt performance, outmigration survival, counts of returning adults, analysis of adult survival data, monitoring of sport fisheries for chinook salmon and steelhead, annual evaluations of past performance which is used for development of new hatchery annual operation plans (AOP).

Coordination outcomes:
Major construction problems were identified and corrected in a cleanup contract administered by the Corps during 1994. 1995. Activities involved correcting deficiencies and were funded using remaining $ from earlier obligations. Other common outcomes of the project are used to coordinate: hatchery planning and rearing schedules, schedule acclimation / release schedules, marking and tagging schedules.

MONITORING APPROACH
The Region should measure the project's outcomes by comparing the stated goals and objectives of the project with actual results acheived.

Provisions to monitor population status or habitat quality:
Refer to M&E project # 9000500. Extensive marking and tagging has been completed to monitor the population status of all target stocks. Numbers tagged were selected to provide a minium of 35 mark recoveries per test group, Returning adults are enumerated at several locations to ensure the target populations are adequately monitored including coordination of tag recoveries with PSMFC, counts of adults at Three-Mile Falls Dam (Umatilla River), creel and spawning ground surveys.

Data analysis and evaluation:
Refer to M&E Project # 9000500.

Information feed back to management decisions:
Information is fed back to Fish Division and Regional management staff throughmonthly and quarterly reports, annual reports, monthly research coordination meetings for the Umatilla Basin and through a regional research process.

Critical uncertainties affecting project's outcomes:
Refer to M&E Project # 9000500.

EVALUATION

The project's overall performance can be assessed through completion of the specific measurable objectives. Other measures include annual reports, completion of tasks identified in the Annual Operation Plan (AOP), numbers of returning adult salmon and steelhead, commercial, and sport fishing benefits provided and the acheivement of harvest objectives.

Incorporating new information regarding uncertainties:

The adaptive management process will be used to re-evaluate current and planned programs. Changes may include increasing or reducing fish releases into the Umatilla River, and expanding or eliminating use of Oxygen supplementation. In addition, regional research, Fish Division and hatchery staff share their findings at meetings to involve all parties in the decision making process.

Increasing public awareness of F&W activities:

We are increasing public awareness through the ODFW outreach program and enviromental education efforts. Outreach efforts have included presentations to the public, creation of fishing information guides, listing of numbers of fish released and adult returns, individual contacts with anglers, creation and printing of hatchery information brochures, hatchery tours to school groups, poster displays at schools and symposiums, radio information shows, regional recreation reports, and newspaper articles.

RELATIONSHIPS

RELATED BPA PROJECT	RELATIONSHIP
8710002 Habitat Improvement	Instream riparian habitat improvement on National Forests, Tribal, and Private lands.
8710001 Habitat Improvement	Instream riparian habitat improvement on National Forests, Tribal, and Private lands.
8701000 Minthorne Springs Creek Summer Juvenile Release and Adult Collection Facility	Instream riparian habitat improvement on National Forests, Tribal, and Private lands.
9000501 Umatilla Basin Natural Production M&E	Same as above
8902401 Outmigration Studies	Evaluate effects and efficiency of compartmented raceways, rearing density and the use of supplemental oxygen on adult survival of chinook salmon and steelhead.This study evaluates the outmigration success of hatchery and naturally produced juvenile salmonids. Completion of tasks includes identifying the amount and location of juvenile mortality in the Umatilla River, success of outmigration for different rearing and release strategies, and description of their outmigration.This study evaluates the amount and extent of salmonid natural production in the Umatilla Basin. Identification is critical to determining the success of hatchery programs aimed at restoring and supplementing naturally producing populations.Operation and monitoring of smolts that are acclimated prior to being released in the Umatilla River. Acclimation is being used to reduce straying of Umatilla fall chinook salmon into the Snake River.Provides low water passage of fish in the Umatilla River by trapping fish and hauling to sections of
8343600 Umatilla Passage O&M	Design, Construct, Operate and Maintain five fish passage facilities at ThreeMile Dam and WEID Canal screens.
8710000 Habitat Improvement	Instream riparian habitat improvement on National Forests, Tribal, and Private lands.
9000500 Umatilla Hatchery Monitoring and Evaluation	Same as above

OPPORTUNITIES FOR COOPERATION:

Continued operation of the Umatilla Hatchery is contingent on BPA obtaining an approved Biological Opinion from the National Marine Fisheries Service and funding identified for hatchery operation and maintenance requirements. Interagency coordination/communication is through the following forums: The Production Advisory Committee (PAC), Technical Advisory Committee (TAC), Integrated Hatchery Operations Team (IHOT), Pacific Northwest Fish Health Protection Committee (PNFHPC), In-River Agreements with parties to U.S. v Oregon, and communications involving staff from the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and the Oregon Department of Fish and Wildlife (ODFW) to discuss the operation and management of the hatchery and satellite facilities.

COSTS AND FTE

1997 Planned: $797,050

FUTURE FUNDING NEEDS:

FY	$ NEED	% PLAN	% IMPLEMENT	% O AND M
1998	$837,000			100%
1999	$879,000			100%
2000	$922,000			100%
2001	$969,000			100%
2002	$1,017,000			100%

PAST OBLIGATIONS (incl. 1997 if done):

FY	OBLIGATED
1995	$908,000
1997	$797,050
TOTAL:	$1,705,050

Note: Data are past obligations, or amounts committed by year, not amounts billed. Does not include data for related projects.

OTHER NON-FINANCIAL SUPPORTERS:
Oregon Department of Fish and Wildlife, Confederated Tribes of the Umatilla Indian Reservation, Washington Department of Fish and Wildlife, National Marine Fisheries Service, Fish Passage Center, Pacific States Marine Fisheries Commission, U.S. Fish and Wildlife Service, Bureau of Reclamation, Umatilla Basin Irrigation Districts, and the Northwest Power Planning Council.

LONGER TERM COSTS: Exceeding $1,017,000 annually.
For Operation and Maintenance

1997 OVERHEAD PERCENT: 22%

HOW DOES PERCENTAGE APPLY TO DIRECT COSTS:
[Overhead % not provided so BPA appended older data.] Indirect applies to all items except Fish Feed, Contract Services, and Capital Expenditures.